

## ABSTRACT OF THE DISCLOSURE

Treatment of digested or O<sub>2</sub> delignified cellulosic pulp in a chlorine dioxide (D<sub>O</sub>) delignification stage, preceding bleaching of the pulp, at a medium pulp consistency for an extended period of time. Unexpected benefits include improvement in the  
5 delignification efficiency and selectivity, a lowering of the chlorine dioxide consumption in the overall post-digestion or post-O<sub>2</sub> delignification and bleaching process, a reduction in the filtrate volume, a reduction of COD/AOX from an ECF bleaching plant, improved pulp properties, and enhanced removal of Hex-A. The process may be implemented in existing three, four or five-stage bleaching plants.